

REMARKS

Applicants are amending their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claim 1 to further clarify that the property that the material can electrically connect first and second circuit members is a substantive recitation in the claims, and not “preamble” language. Thus, Applicants have amended claim 1 to recite that the circuit connecting material has the specified property when specified insulating layers are located adjacent to at least one of the first and second circuit electrodes of the first and second circuit members. Applicants have amended claim 19 to recite that the insulating layers of silicon dioxide or silicon nitride are located adjacent to “both” of the first and second circuit electrodes, with at least some of these insulating layers being formed so that these layers are thicker than the circuit electrodes on the basis of the main surface of the circuit board in “both” of the first and second circuit members.

Additionally, Applicants are adding new claim 26 to the application. Claim 26, dependent on claim 1, recites that this circuit connecting material has the specified property set forth in claim 1, when the insulating layers are located adjacent to both of the first and second circuit electrodes, with at least some of the insulating layers being formed such that these layers are thicker than the first and second circuit electrodes on the basis of the main surface in both of the first and second circuit members.

In connection with amendments to the present claims, note, for example, Fig. 1 of Applicants’ original disclosure, together with the description in connection therewith, e.g., on pages 12 and 13 of Applicants’ specification.

Initially, the Form PTO-892 enclosed with the Office Action mailed June 30, 2010, is noted. This Form PTO-892 lists, as a foreign patent document, “WO 03/02249 A1”; and, moreover, does not list U.S. Patent Application Publication No. 2004/0266913. As the applied Yamaguchi, et al. published International application has a number “WO 03/022949” (not WO 03/02249 as on the Form PTO-892 enclosed with the Office Action mailed June 30, 2010), and as this Form PTO-892 does not list the above-referred to published U.S. patent document, it is respectfully requested that the Examiner issue a new Form PTO-892 fully identifying the Yamaguchi, et al. documents as applied by the Examiner in the Office Action mailed June 30, 2010.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed June 30, 2010, that is, the teachings of the U.S. patent documents to Yamaguchi, et al., Patent Application Publication No. 2004/0266913, and to Tsukagoshi, et al., Patent No. 6,338,195, Japanese Patent Document No. 2001-189171 (identified by the Examiner as “Sony”), and Japanese Patent Document No. 2000-208178 (identified by the Examiner as “Kubota”), under the provisions of 35 USC 102 and 35 USC 103.

Initially, Applicants respectfully traverse the contention by the Examiner on page 4 of the Office Action mailed June 30, 2010, that the recitation of having a property that the material can electrically connect ... first and second circuit members is preamble language and is to be given “little patentable weight”, particularly insofar as this contention is applicable to the claims as presently amended. That is, it is respectfully submitted that the property of the circuit

connecting material is a positive recitation in the claims, and is not preamble language, and must be given full consideration in any determination of patentability of the circuit connecting material. Contrary to the contention by the Examiner on page 4 of the Office Action mailed June 30, 2010, it is respectfully submitted that this property is not a recitation of intended use of the composition; and, clearly, especially as presently amended, the recitation of this property is not “preamble” language.

It is respectfully submitted that these references as applied by the Examiner would have neither disclosed nor would have suggested such a circuit connecting material as in the present claims, wherein the material has a property that it can electrically connect the recited circuit members, with the recited insulating layer adjacent a circuit electrode of at least one of the circuit members, the insulating layer being thicker than such circuit electrode, and including, inter alia, wherein the material includes conductive particles which have a hardness of 4.4413-6.865 GPa, and wherein the material exhibits a storage elastic modulus of 0.5-3 GPa at 40°C and a mean coefficient of thermal expansion of 30-200 ppm/°C at from 25°-100°C. See claim 1.

It is emphasized that, as will be discussed in more detail infra, such circuit connecting material can be used to electrically connect circuit members having first and second circuit electrodes located on surfaces of respective circuit boards having insulating layers of silicon dioxide or silicon nitride adjacent the circuit electrodes, with at least some of the insulating layers being formed such that the insulating layers are thicker than the circuit electrodes.

It is respectfully submitted that through use of the material having conductive particles, (1) with the conductive particles having a hardness of 4.4413-6.865 GPa,

and the material (2) having a mean coefficient of thermal expansion of 30-200 ppm/°C at from 25°-100°C and (3) a storage elastic modulus of 0.5 to 3 GPa at 40°C, unexpectedly better results in reduced connection resistance between the electrodes connected, and improved bonding strength, are achieved.

In connection therewith, attention is respectfully directed to the Declaration Under 37 CFR 1.132 of M. Arifuku, submitted with the Amendment filed June 16, 2010. This Declaration includes Additional Examples 1 and 2 within the scope of the present claims, Additional Reference Example 1 outside the scope of the present claims, and Additional Comparative Examples 1 and 2, also outside the scope of the present claims. Note Item 6 of this Declaration submitted June 16, 2010. The Additional Reference Example 1 falls outside the scope of the present claims, in using Conductive Particles No. 18, having a hardness outside the scope of the present claims. Additional Comparative Example 1 falls outside the scope of the present claims, in having a storage elastic modulus at 40°C outside the scope of the present claims; and Additional Comparative Example 2 falls outside the scope of the present claims, in having a mean coefficient of thermal expansion higher than 200 ppm/°C, i.e., greater than the maximum set forth in the present claims.

In connection with the Declaration submitted June 16, 2010, note the bonding strength, in Item 8 thereof; and, in particular, the results in Table I and discussion in connection with Additional Comparative Example 1 in Item 9 of this Declaration; i.e., that the bonding strength could not be measured because the bonding agent had peeled away, because the storage elastic modulus at 40°C (4.3 GPa) exceeded 3 GPa and internal stress increased.

Note also Item 10 and Table II of this Declaration, and discussions in connection with the results shown in this Table II in Items 11 and 12; i.e., in

Additional Reference Example 1, the connection resistance was higher than that of the Additional Examples 1 and 2 because the hardness of Conductive Particles No. 18 was lower than 4.4413 GPa; and that in Additional Comparative Example 2, the connection resistances were higher than that of the Additional Examples 1 and 2, because the mean coefficient of thermal expansion was higher than 200 ppm/°C.

Note also Table III in Item 14 of this Declaration; and the discussion of results therein in Items 15 and 16 of the Declaration; that is, that in Additional Reference Example 1, the connection resistances were higher than that of the Additional Examples 1 and 2, because hardness of Conductive Particles No. 18 was lower than 4.4413 GPa, and that in Additional Comparative Example 2, the connection resistances were higher than that of the Additional Examples 1 and 2, because the mean coefficient of thermal expansion was higher than 200 ppm/°C.

Note also Item 17 of this Declaration, stating that through use of the circuit connecting material of the present invention, it is possible to achieve a sufficient reduction in the connection resistance and a sufficient bonding strength, and in view of unexpectedly better results shown in Additional Examples 1 and 2, these effects are unexpected from the cited references.

It is respectfully submitted that from this evidence in this Declaration submitted June 16, 2010, alone, Applicants have shown unexpectedly better results achieved where the circuit connecting material contains conductive particles having, inter alia, a hardness of 4.4413 to 6.865 GPa, and where the circuit connecting material exhibits, when cured, a storage elastic modulus of 0.5-3 GPa at 40°C, and a mean coefficient of thermal expansion of 30-200 ppm/°C at from 25 -100°C, providing a basis for a conclusion of unobviousness of the presently claimed subject matter, even were the teachings of the applied references to establish a prima facie

case of obviousness (as will be shown in the following, it is respectfully submitted that the teachings of these references would not have established such a prima facie case).

Further supporting the evidence in the Declaration, attention is respectfully directed to the evidence in Applicants' specification. In particular, attention is respectfully directed to the results of Examples as set forth in Table 3 on page 58 of Applicants' specification, and the discussion in connection therewith in paragraphs [0136]-[0138] on pages 58 and 59 of Applicants' specification. In connection with these Examples, note description of the Examples on pages 50-54 of Applicants' specification, and description of the hardness of the conductive particles in Tables 1 and 2 on page 50 of Applicants' specification. Note particularly the discussion in paragraph [0138] on page 59 of Applicants' specification, that where the conductive particles used were too hard, sufficient flattening of the conductive particles cannot be obtained, and there was a rise in the connection resistance following the high-temperature, high-humidity treatment. It is respectfully submitted that this evidence in Applicants' specification must be considered in determining patentability of the presently claimed subject matter (see In re DeBlauwe, 222 USPQ 191 (CAFC 1984)), and further supports a conclusion of unobviousness of the presently claimed subject matter, based upon establishing unexpectedly better results achieved by the present invention.

Furthermore, it is respectfully submitted that these references would have neither disclosed nor would have suggested such circuit connecting material as in the present claims, having conductive particles with a hardness, the material having a storage elastic modulus and mean coefficient of thermal expansion, as discussed previously in connection with claim 1, and, additionally, structure of the conductive

particles, and material thereof, as in claims 2 and 3; and/or material of the bonding agent composition of the circuit connecting material, as in claims 4 and 5; and/or glass transition temperature of the circuit connecting material, as in claim 6, and as more particularly defined in claim 24; and/or further definition of the storage elastic modulus as in claim 25; and/or wherein the material has a property to electrically connect the circuit members when insulating adjacent both the first and second circuit electrodes are thicker than the circuit electrodes (see claim 26).

Moreover, it is respectfully submitted that the teachings of these applied references would have neither disclosed nor would have suggested such circuit connecting material as in the present claims, having features as discussed in connection with claim 1, and, additionally, wherein the circuit connecting material further contains a film forming material (see claim 7), in particular, wherein such film forming material is a phenoxy resin (see claim 8); and/or the film-form circuit connecting material formed by forming the circuit connecting material according to claim 1 into the shape of a film (see claim 9).

Additionally, it is respectfully submitted that these references as applied by the Examiner would have neither disclosed nor would have suggested such a method for manufacturing a circuit member connecting structure as in the present claims, which includes first and second circuit members respectively having first and second circuit electrodes on main surfaces of circuit boards thereof, and wherein insulating layers of silicon dioxide or silicon nitride are located adjacent to both of the first circuit electrodes and the second circuit electrodes and at least some of the insulating layers being formed so that these layers are thicker than the circuit electrodes, including interposing the film-form circuit connecting material according to claim 9 (which has the conductive particles with hardness as in claim 1, and the

material has the storage elastic modulus and mean coefficient of thermal expansion of the material as in claim 1) between main surfaces of the first and second circuit boards and curing the circuit connecting material by application of heat and pressure so that the first and second circuit electrodes are electrically connected via conductive particles of the film-form circuit connecting material. See claim 19.

Furthermore, it is respectfully submitted that the teachings of these applied references would have neither disclosed nor would have suggested such method as in the present claims, having features as discussed previously in connection with claim 19, and, additionally, the difference in thickness between the insulating layer and adjacent first and second circuit electrodes, as in claim 22; and/or thickness of the film-form circuit connecting material as in claim 23.

The invention as being considered on the merits in the above-identified application is directed to a circuit connecting material, film-form circuit connecting material utilizing such circuit connecting material, and a method of manufacturing a circuit member connecting structure utilizing such film-form circuit connecting material.

Circuit member connecting structures used for the mutual connection of circuit members such as liquid crystal displays, tape carrier packages, flexible printed circuits, and printed wiring boards, among other uses, have been known in the past. Circuit connecting materials in which conductive particles are dispersed in a bonding agent have been proposed for the connection of circuit members, as described in paragraph [0002] on page 1 of Applicants' specification.

However, as circuits have been formed with progressively higher densities, so that spacing between circuit electrodes and the width of circuit electrodes have become narrow, it has become difficult to ensure high insulating properties between

adjacent circuit electrodes on a surface, and it has been considered necessary to form an insulating layer comprising, e.g., silicon dioxide or silicon nitride between the adjacent circuit electrodes.

In providing structure having such insulating layers of silicon dioxide or silicon nitride, portions of the insulating layers ride over the edges of the circuit electrodes; and, specifically, as described in the sentence bridging pages 2 and 3 of Applicants' specification, in connection with Fig. 7 of Applicants' original disclosure, portions of the insulating layers 134 are formed with a greater thickness than the circuit electrodes 133 on the basis of the surface 132a of the circuit board 132. Various problems arise in connection with such structure. For example, connection resistance between the facing circuit electrodes is large, and long-term reliability of the electrical characteristics is insufficient. Thus, where conductive particles lie between the insulating layers with greater thickness, there can be insufficient contact between facing circuit electrodes via conductive particles, whereby a disadvantageously high connection resistance can occur.

Against this background, Applicants provide a circuit connecting material that can sufficiently reduce connection resistance between facing circuit electrodes, and that is superior in terms of long-term reliability of electrical characteristics. As a result of diligent research by the present inventors, the present inventors have found that hardness of the conductive particles is an issue in connection with the circuit connecting material. Specifically, as described in paragraph [0008] bridging pages 4 and 5 of Applicants' specification, the present inventors discovered that if the hardness of the conductive particles is excessively large, the conductive particles become caught between the insulating films that ride over the edges of the circuit electrodes, so that the conductive particles do not make sufficient contact with both

of the facing circuit electrodes; and that, as a result of this, the connection resistance between the facing circuit electrodes is increased. See, e.g., Fig. 7 of Applicants' disclosure.

Having discovered the source of this problem, the present inventors discovered that by utilizing a bonding agent composition and conductive particles as in the present claims, the conductive particles having a mean particle size and hardness as in the present claims, with the material, after curing, exhibiting a storage elastic modulus and mean coefficient of thermal expansion as in the present claims, objectives according to the present invention are achieved; and, in particular, a circuit connection can be achieved having reduced connection resistance and long-term reliability of the electrical characteristics. As described in paragraph [0011] on page 6 of Applicants' specification, even if conductive particles become caught between the insulating layers that face each other, with use of conductive particles having a hardness as in the present claims the conductive particles are appropriately flattened so that the distance between the facing circuit electrodes can be sufficiently reduced. See, e.g., Figs. 1 and 2 of Applicants' disclosure. Moreover, as the circuit members are firmly connected by the curing treatment of the circuit connecting material, so that variation in distance between the first and second circuit electrodes over time can be sufficiently reduced, superior long-term reliability of electrical characteristics is achieved.

In particular, as described in paragraphs [0041] and [0042] on pages 17 and 18 of Applicants' specification, and as continued in paragraph [0043] thereof, by incorporating conductive particles having a hardness of a maximum of 6.865 GPa, the conductive particles can be sufficiently flattened so as to avoid increase in electrical resistance.

Furthermore, by utilizing the material which, when cured, has a storage elastic modulus and mean coefficient of thermal expansion as in the present claims, an increase in connection resistance in the connecting parts as a result of internal stress, and peeling away of the bonding agent, can be avoided. Note paragraph [0065] on page 29, and paragraph [0069] bridging pages 30 and 31, of Applicants' specification. See the results in the Tables I-III of the Declaration submitted June 16, 2010, and the discussion thereof in Items 9, 11, 12, 15 and 16 of this Declaration.

Furthermore, by utilizing a circuit connecting material having a glass transition temperature as in various of the present claims, a reduction in bonding strength at high temperature and a rise in connection resistance can be avoided, and internal and interfacial stresses in the circuit connecting member, which can cause cracking to occur and a reduction in bonding strength, can be avoided.

Yamaguchi, et al. discloses an anisotropically electroconductive or heat-conductive adhesive composition capable of exhibiting good electrical or thermal conductivity, and, at the same time, excellent adhesive strength. The composition, which is a cationic polymerizable adhesive composition, comprises (A) a cationic polymerizable monomer selected from an epoxy monomer, a vinyl ether monomer and a mixture thereof, (B) a cationic polymerization catalyst, and (C) a stabilizer, the stabilizer being further defined as being at least one acid amide of a specified formula. Note paragraphs [0001], [0010] and [0011] on page 1 of this patent document. See also paragraph [0030] on page 3 of this patent document, describing examples of the electroconductive particle; and note the Examples beginning in paragraph [0042] on page 5 of this patent document, describing production of an anisotropically electroconductive adhesive film.

It is respectfully submitted that Yamaguchi, et al. does not disclose, nor would have suggested, a hardness of the electroconductive particles, or storage elastic modulus or mean coefficient of thermal expansion of the cured material, as in the present claims, and advantages thereof.

The contention by the Examiner on page 4 of the Office Action mailed June 30, 2010, that Yamaguchi, et al. discloses electroconductive Au/Ni/divinylbenzene particles with a particle size of 5 microns, is noted. However, it is respectfully submitted that disclosure of such particles does not necessarily mean that the particles have a same hardness as that recited for the electroconductive particles in the present claims. That is, these particles of Yamaguchi, et al. may have a different hardness. In connection therewith, attention is respectfully directed to the conductive particles of Numbers 8, 9, 13 and 14 of Table 1, on page 50 of Applicants' specification. These conductive particles of Numbers 8, 9, 13 and 14 are electroconductive particles of Au/Ni/divinylbenzene, and have a hardness outside the range set forth in the present claims. This evidence in Applicants' specification clearly establishes that disclosure of Au/Ni/divinylbenzene particles in Yamaguchi, et al. would not have disclosed, or would have suggested, electroconductive particles of a hardness as in the present claims, or advantages thereof.

In addition, attention is respectfully directed to the disclosure of the circuit connecting materials of Comparative Examples 3, 4, 7 and 8, containing the electroconductive particles of Numbers 8, 9, 13 and 14, respectively; results of use of the connecting materials of Comparative Examples 3, 4, 7 and 8 are set forth in Table 3 on page 58 of Applicants' specification, which show that the connecting materials of these Comparative Examples 3, 4, 7 and 8 have disadvantageously large connection resistance and a short-time reliability. This evidence in Applicants'

specification, which must be considered in determining unobviousness (see In re DeBlauwe, supra), as compared with use of conductive particles within the scope of the present claims, shows the unexpectedly better results achieved through use of the particles with a hardness as in the present claims.

The Examiner also contends, on page 4 of the Office Action mailed June 30, 2010, that the connection resistance taught by Yamaguchi, et al. is “either [the] same or substantially [the] same as that taught by [Applicants]”. Such contention by the Examiner is respectfully traversed. It is respectfully submitted that the structure of circuit members used in Examples of Yamaguchi, et al. is different from that of the present application. That is, circuit members used in Examples of Yamaguchi, et al. are 2-layer FPC and glass plate with ITO (note paragraph [0046] on page 5 of Yamaguchi, et al.), while circuit members used in Examples of the present invention are 2-layer FPC or 3-layer FPC and a “second circuit member” comprising a glass substrate, ITO circuit and an insulating layer which is thicker than the ITO circuit. Therefore, it is respectfully submitted that comparison of the connection resistance as disclosed in Yamaguchi, et al., and as described in the present application, is an unfair comparison. In contrast, note that the connection resistance of Yamaguchi, et al., utilizing the 2-layer FPC, is at best 1.6 Ω , as can be seen in Table 1 on page 6 of Yamaguchi, et al. The connection resistance according to the present invention, with a 2-layer FPC, is 0.56-1.28 Ω . That is, the connection resistance according to the present invention is lower than that of Yamaguchi, et al. Particularly in view thereof, it is respectfully submitted that the circuit connecting material according to the present invention has a remarkable effect of reducing connection resistance.

Furthermore, it is respectfully submitted that Yamaguchi, et al. provides no disclosure as to the effect on long-term reliability of electrical characteristics, due to

exposure to high temperature and high humidity. As can be appreciated from Applicants' disclosure, and the evidence of record, through use of the circuit connecting material of the present claims, having conductive particles with a hardness as set forth therein, and wherein the cured material has a storage elastic modulus and mean coefficient of thermal expansion as in the present claims, a disadvantageous increase in connection resistance after exposure to high temperature and high humidity can be avoided.

Moreover, it is again emphasized that Yamaguchi, et al. does not disclose, nor would have suggested, a storage elastic modulus or mean coefficient of thermal expansion of the cured product of the cationic polymerizable adhesive composition described therein. As can be seen in the evidence of record, including the Declaration submitted June 16, 2010, sufficient bonding strength, with reduced connection resistance and with long-term reliability of electrical characteristics, can be achieved by the material of the present invention, having the recited storage elastic modulus and mean coefficient of thermal expansion, among features.

The contention by the Examiner in the second full paragraph on page 5 of the Office Action mailed June 30, 2010, is noted. Even assuming, arguendo, that the burden is upon Applicants, it is respectfully submitted that Applicants have provided such proof through the evidence in their specification and the Declaration submitted June 16, 2010, discussed previously.

It is respectfully submitted that the teachings of the secondary references as applied by the Examiner would not have rectified the deficiencies of Yamaguchi, et al., such that the presently claimed invention as a whole, as set forth in claims 2, 3 and 19-23, would have been obvious to one of ordinary skill in the art.

Sony discloses an anisotropic conductive connection material and use thereof, such connection material being adhered mechanically without damaging a passivation film. This patent document discloses a semiconductor device having electrodes 4 at a lower position than a passivation film 5, which generally is made of a resin, connected to a circuit board by connection material 6 having adhesive components 7 and conductive particles 8. The particles, having a nucleus covered with a metal layer, are used as conductive particles, and are of a diameter d of not less than 1.5 times the height difference between the passivation film 5 and the electrodes 4, and not more than 0.5 times the interval between the electrodes. Note, in particular, paragraphs [0007], [0008] and [0015]-[0020] of this patent document. This patent document discloses that the hardness (K value) of the conductive particles is 500-100,000 N/mm², preferably 1,000-8,000 N/mm². See paragraph [0020] of this patent document. This patent document focuses on the hardness of the conductive particles to avoid possible damage to the passivation film. See paragraph [0034] of this patent document.

It is respectfully submitted that this reference, either alone or in combination with the teachings of the other applied references, does not disclose, nor would have suggested, the material according to the present invention, having the insulating layer of silicon dioxide or silicon nitride (the reference disclosing a resin passivation layer), or the thicker insulating layer adjacent both the first and second circuit electrodes, or the hardness of the conductive particles, or storage elastic modulus or mean coefficient of thermal expansion of the circuit connecting material (after curing), and unexpectedly better results achieved thereby; and/or other advantages of the present invention as discussed in the foregoing, and advantages achieved thereby.

Emphasizing that Sony focuses on a different effect for the conductive particles (that is, avoiding damage of the passivation film), rather than avoiding increased connection resistance as in the present invention, it is respectfully submitted that the disclosure of this patent document would have taught away from features of the present invention, including the specific range of hardness of the conductive particles, as in the present claims, and advantages thereof.

Tsukagoshi, et al. discloses a connection sheet for firmly bonding an electronic component such as a semiconductor chip to a circuit board to achieve electrical connection between electrodes of the two components, the connection sheet including a first adhesive layer made of a first adhesive having an electrical insulating property, a second adhesive layer placed over the first adhesive layer, the second adhesive layer containing a second adhesive having an electrical insulating property and an electrically conductive material, and the second adhesive having a viscosity equal to or lower than that of the first adhesive when the first and second adhesives are in a molten state. Note the paragraph bridging columns 2 and 3 of this patent. See also column 3, lines 4-14 of this patent document. Note also the connection structure described in column 4, lines 12-29 of this patent document. As for the conductive material, note column 8, lines 45-63 of this patent document; and note also column 9, lines 4-11, describing that the particle diameter of the conducting particles should preferably be as small as 15 μm or less, more preferably, in the range of 7-1 μm . See also column 10, lines 20-23 of this patent document. Note also the embodiment shown in Fig. 8 and the description in connection therewith in column 13, lines 18-30, of Tsukagoshi, et al., showing a recessed electrode 16, with an unnecessary portion of the electrode (which is an Al pad) being covered with an insulating layer made of silica, silicon nitride, polyimide, etc.

Kubota discloses structure which satisfactorily keeps an insulating property of an anisotropic conductive film between adjacent first terminal electrodes, at low cost, by forming a groove between the first terminal electrodes. Specifically, this patent document discloses a strip anisotropic conductive film being arranged across a groove on a terminal electrode, with a terminal electrode of a liquid crystal panel being opposed and bonded to this terminal electrode (of a drive circuit substrate) through the anisotropic conductive film. This patent document discloses that, as a conductive particle included in the anisotropic conductive film, those having a diameter of 2-3 μm are used. Note, in particular, paragraph [0009] this patent document.

Even assuming, arguendo, that the teachings of Tsukagoshi, et al. and Kubota were properly combinable with the teachings of Yamaguchi, et al. and Sony, such combined teachings would have neither disclosed nor would have suggested the presently claimed material and method, including the specific range for the hardness of the conductive particles, or storage elastic modulus or mean coefficient of thermal expansion of the circuit connecting material after curing, and unexpectedly better results achieved by the combination of these features in reduced resistance, and avoidance of peeling (that is, providing a sufficient bonding strength), as achieved according to the present invention.

It is emphasized that according to the method defined by the present claims, both of the first and second circuit members have insulating layers of silicon dioxide or silicon nitride located adjacent both of the first and second circuit electrodes respectively of the first and second circuit members, at least some of these insulating layers being formed to be thicker than the circuit electrodes in both of the first and second circuit members. Referring specifically to the teachings of Sony, which does

not have such thicker insulating adjacent electrodes of both the first and second circuit members, it is respectfully submitted that the teachings of the applied references, including Sony, would have neither disclosed nor would have suggested such feature of the present invention.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently pending in the above-identified application are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Kindly charge any shortage of fees due in connection with the filing of this paper, including any extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (case 1303.45151X00), and please credit any overpayments to such Deposit Account.

Respectfully submitted,

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